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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,924	09/24/2004	Makoto Motoyoshi	075834.00325	8150
33448	7590	05/16/2007		
ROBERT J. DEPKE LEWIS T. STEADMAN ROCKEY, DEPKE, LYONS AND KITZINGER, LLC SUITE 5450 SEARS TOWER CHICAGO, IL 60606-6306			EXAMINER NGUYEN, TRAM HOANG	
			ART UNIT 2818	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/508,924

Applicant(s)

MOTOYOSHI ET AL.

Examiner

Tram H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-7,9-19,39 and 40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-14 is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7,15-19,39,40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

In response to the communications dated 02/28/2007, claims 39 and 40 have been added. Therefore, claims 1-19, 39 and 40 are pending in this application.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claims 1-3,5-7,14-19 and 39-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (US 2002/0034094; hereinafter refer to Saito).***

Regarding **claim 1**, Saito discloses a nonvolatile magnetic memory device of the type having: a first wiring (item 15); a second wiring (item 16) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (item 13) which is electrically insulated from said first wiring (15) and electrically connected to said second wiring (16) and which is formed in the region of intersection of said first wiring (15) and said second wiring (16) such that a tunnel insulating layer item 22) is sandwiched between ferromagnetic materials (items 21/23) which change in resistance depending on whether the spin direction is parallel or

antiparallel, thereby recording information; wherein said magnetic memory device comprises a magnetic flux concentrator (item 18) formed at least adjacent the lateral sides of said first wiring (item 15) and on the side of said first wiring (15) which is opposite to the side facing said tunnel magnetoresistance element (13).

Regarding **claim 2**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed also on the surface of the first wiring close to the tunnel magnetoresistance element.

Regarding **claim 3**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows an insulating film (19) is formed between the magnetic flux concentrator (18) and the first wiring (15).

Regarding **claim 5**, Saito discloses a nonvolatile magnetic memory device of the type having: a first wiring (item 16); a second wiring (item 15) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (item 13) which is electrically insulated from said first wiring (16) and electrically connected to said second wiring (15) and which is formed in the region of intersection of said first wiring (16) and said second wiring (15) such that a tunnel insulating layer item 22) is sandwiched between ferromagnetic materials (items 21/23) which change in resistance depending on whether the spin direction is parallel or antiparallel, thereby recording information; wherein said magnetic memory device comprises a magnetic flux concentrator (item 18) formed at least adjacent the lateral sides of said first wiring (item

16) and on the side of said first wiring (16) which is opposite to the side facing said tunnel magnetoresistance element (13).

Regarding **claim 6**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed also on the surface of the second wiring close to the tunnel magnetoresistance element.

Regarding **claim 7**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows an insulating film (19) is formed between the magnetic flux concentrator (18) and the second wiring (15).

Regarding **claim 14**, Saito discloses a nonvolatile magnetic memory device of the type having: a first wiring (16); a second wiring (15) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (13) which is electrically connected to said first wiring (16) through a switching element and is electrically connected to said second wiring and which is formed in the region of intersection of said first wiring and said second wiring such that a tunnel insulating layer is sandwiched between ferromagnetic materials which change in resistance depending on whether the spin direction is parallel or antiparallel, thereby recording information (see fig. 9A); wherein said magnetic memory device comprises a magnetic flux concentrator of high-permeability layer (18) formed at least on both of the lateral sides of said first wiring (15) and on the side of said first wiring which is opposite to the side facing said tunnel magnetoresistance element (13), with at least either of said high-permeability layer formed on the lateral sides of said first wiring (15) projecting from said

first wiring toward said tunnel magnetoresistance element (see fig. 10); and wherein the switching element (refer to the switching transistor) is formed substantially co-extensive with the tunnel magnetoresistance element (see fig. 13A)

Regarding **claim 15**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows an insulating film (19) is formed between the magnetic flux concentrator (18) and the tunnel magnetoresistance element (13).

Regarding **claim 16**, Saito discloses a nonvolatile magnetic memory device of the type having: a first wiring (16) and a second wiring (15) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (13) which is electrically connected to said first wiring (16) through a switching element and is electrically connected to said second wiring (15) and which is formed in the region of intersection of said first wiring (16) and said second wiring (15) such that a tunnel insulating layer (22) is sandwiched between ferromagnetic materials (21/23) which change in resistance depending on whether the spin direction is parallel or antiparallel, thereby recording information (see fig. 9A); wherein said magnetic memory device comprises a magnetic flux concentrator of high-permeability layer (18) formed at least on both of the lateral sides of said second wiring (16) and on the side of said second wiring (16) which is opposite to the side facing said tunnel magnetoresistance element (13), with at least either of said high-permeability layer formed on the lateral sides of said second wiring projecting from said second wiring toward said tunnel magnetoresistance element (see fig. 10); and wherein the switching element (refer to

the switching transistor) is formed substantially co-extensive with the tunnel magnetoresistance element (see fig. 13A).

Regarding **claim 17**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed also on the surface of the second wiring close to the tunnel magnetoresistance element.

Regarding **claim 18**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows wherein an insulating film (19) is formed between the magnetic flux concentrator (18) and the second wiring (15).

Regarding **claim 19**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed, with an insulating film interposed, also on the surface of the second wiring close to the tunnel magnetoresistance element.

Regarding **claim 39**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows at least either of said high-permeability layer (18) formed adjacent the lateral sides of said first wiring (15) projects beyond said first wiring (15) and toward said tunnel magnetoresistance element (18).

Regarding **claim 40**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, fig. 10 shows at least either of said high-permeability layer (18) formed adjacent the lateral sides of said second wiring (item 15)

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projects beyond said second wiring (15) and toward said tunnel magnetoresistance element (13).

***Allowable Subject Matter***

Claims 9-13 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding **claim 9**, the prior art of record alone or in combination neither teaches nor makes obvious the invention of a semiconductor fuse arrangement wherein "said magnetic memory device comprises a magnetic flux concentrator of high-permeability layer formed between said first wiring and said tunnel magnetoresistance element and on adjacent the lateral sides of said tunnel magnetoresistance element, with an insulating film interposed therebetween." in combination of all of the limitations of claim 9. Claim 12 includes all of the limitations of claim 9.

Regarding **claim 10**, the prior art of record alone or in combination neither teaches nor makes obvious the invention of a semiconductor fuse arrangement wherein "said magnetic memory device comprises a first magnetic flux concentrator of high-permeability layer formed at least adjacent both of the lateral sides of said first wiring and on the side of said first wiring, which is opposite to the Side facing said tunnel magnetoresistance element and a second magnetic flux concentrator of high-permeability layer formed between said first wiring and said tunnel magnetoresistance element and adjacent the lateral sides of said tunnel magnetoresistance element, with



an insulating film interposed therebetween." in combination of all of the limitations of claim 10. Claims 11 and 13 include all of the limitations of claim 10.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tram Hoang Nguyen whose telephone number is (571)272-5526. The examiner can normally be reached on Monday-Friday, 8:30 AM – 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mathew Smith can be reached on (571)272-1907. The fax numbers for all communication(s) is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

THN  
Art Unit 2818  
05/11/2007

*Andy Nguyen*

*Andy Nguyen  
Primary Examiner*